CLAIMS

1. A method for measuring optical characteristics of a sub-component within a composite optical system, said method comprising:

a) generating an optical response from said composite optical system;

b) separating an optical response of said sub-component from said optical response of said composite optical system; and

c) determining said optical characteristics of said sub-component by utilizing at least one portion of said optical response of said sub-component.

2. The method as recited in Claim 1 wherein step a) comprises generating said optical response from said composite optical system by:

providing an input optical signal having a time-varying frequency; and

illuminating said composite optical system with said input optical signal.

3. The method as recited in Claim 2 wherein step c) comprises

determining amplitude and phase of said optical response of said sub-component;

detecting a reference phase of said input optical signal; and

determining said optical characteristics of said sub-component by utilizing said amplitude and phase of said optical response of said sub-component and said reference phase of said input optical signal.

4. The method as recited in Claim 1 wherein said optical response is comprised of a heterodyne beat signal corresponding to said sub-component of said composite optical system.

5. The method as recited in Claim 4 wherein said step b) comprises using a bandpass filter to separate from a plurality of heterodyne beat signals said heterodyne beat signal corresponding to said sub-component.

6. The method as recited in Claim 5 wherein step c) comprises utilizing orthogonal filters to determine amplitude and phase of said heterodyne beat signal corresponding to said sub-component.

7. The method as recited in Claim 1 wherein said at least one portion of said optical response of said sub-component is an amplitude portion of said optical response of said sub-component.

8. The method as recited in Claim 1 wherein said at least one portion of said optical response of said sub-component is a phase portion of said optical response of said sub-component.

9. The method as recited in Claim 1 wherein said at least one portion of said optical response of said sub-component is an amplitude portion and a phase portion of said optical response of said sub-component.

10. The method as recited in Claim 1 wherein step c) wherein said optical characteristics of said sub-component are selected from the group comprising reflectivity, transmissivity, and group delay.

11. A system for measuring optical characteristics of a sub-component of a composite optical system in response to an input light signal, said system comprising:

an optical detector optically coupled to said composite optical system to receive said optical response of said composite optical system;

a filter coupled to said optical detector, said filter for separating an optical response of said sub-component from said optical response of said composite optical system; and

a processing unit coupled to said filter, said processing unit for determining said optical characteristics of said sub-component by utilizing at least one portion of said optical response of said sub-component.

12. The system of Claim 11 wherein said input light signal is generated by a light source which generates an input light signal having a time-varying frequency.

13. The system of Claim 11 wherein said at least one portion of said optical response of said sub-component is an amplitude portion of said optical response of said sub-component.

14. The system of Claim 11 wherein said at least one portion of said optical response of said sub-component is a phase portion of said optical response of said sub-component.

15. The system of Claim 11 wherein said at least one portion of said optical response of said sub-component is an amplitude portion and a phase portion of said optical response of said sub-component.

16. The system of Claim 11 wherein said optical response of said composite optical system is comprised of a plurality of heterodyne beat signals.

17. The system of Claim 16 wherein said filter is configured to separate from said plurality of heterodyne beat signals a heterodyne beat signal corresponding to said sub-component.

18. The system of Claim 17 wherein said processing unit comprises orthogonal filters for determining amplitude and phase of said heterodyne beat signal corresponding to said sub-component.

19. The system of Claim 11 wherein said optical characteristics of said sub-component are selected from the group comprising reflectivity, transmissivity, and group delay.

20. The system of Claim 11 further comprising:

a second optical detector adapted to be optically to said input light signal, said second optical detector configured to detect a reference phase of said input light signal, and

said first optical detector configured to detect a plurality of heterodyne beat signals comprising said optical response.